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Relationship between Perceived Labour Market Rewards and the Health of Senior Workers

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According to Siegrist's effort-reward imbalance (ERI) model, the feeling that one's labour-effort is inadequately rewarded generates a psychological risk factor with an adverse effect on health. On the basis of the European SHARE survey carried out in 2004 and 2006 among individuals aged 50 and over, this study attempts to measure the effects of ERI on elderly workers' health status and identify work-related factors that could explain this imbalance.

According to our results, the probability of self-reporting activity limitations increases by 8 points among older workers experiencing ERI in 2004 and 2006, and the probability of self-reporting joint pain or backache by over 12 points.

The perceived imbalance between the effort expended at work and the rewards received, more prevalent among blue-collar workers and clerks than executives, is equally associated with physically demanding work, workload and perceived job insecurity. The effort-reward imbalance at work is less frequently experienced by employees working in small companies (less than 15 employees) and self-employed workers than those working in medium-sized companies (25 to 199 employees). Finally, the results reveal significant disparities between European countries in the perceived rewards in exchange for effort. This reflects the differences between northern European countries with higher employment performance in the employment of seniors and those with lower employment performance such as France.

The health status of older workers and maintaining them in employment are closely linked with the implementation throughout the professional pathway of preventive measures to counter the adverse effects of work on health. The experience delivered by Scandinavian countries demonstrates the efficiency of policies promoting quality of work in increasing the employment rate of older workers and underlines the complementarities of these two dimensions (Polak, 2009).

Workers' health status can be affected by different work-related dimensions (Lasfargues, 2005): physically demanding work, night work, the use of toxic products or work-related psychosocial risk (Expert committee on monitoring work-related psychosocial risk, 2011)...

Using data from the European SHARE conducted in 2004 and 2006 among individuals aged 50 and over, we analyse one of the dimensions of psychosocial risk according to the model developed by

Siegrist (1996): the perceived imbalance between the effort expended at work and the rewards received in return. According to this model, experienced effort-reward imbalance (ERI) has an adverse effect on the health of exposed workers. The psychological tension resulting from this imbalance generates a stress factor contributing to health deterioration. This risk is all the more cause for concern in the current context of flexible, increasingly precarious employment, which is not favourable to creating

a balance between labour-effort and reward.

The aim of this study is twofold: on the one hand it aims at measuring the relationship between poor health status and perceived effort-reward imbalance at work and on the other, identifying work-related factors that may explain this imbalance.

Poorer health status among individuals experiencing effort-reward imbalance

The results of several empirical epidemiological studies support the Siegrist model hypothesis that perceived ERI at work presents a health risk. According to these studies, the ERI is correlated to the risk of cardiovascular disease (Bosma *et al.*, 1998), the probability of self-reporting poor health, the risk of depression (Pikhart *et al.*, 2004), the appearance of muscular-skeletal disorders (Rugulies and Krause, 2008), health risk behaviours (alcohol and tobacco consumption) and sickness absence (Schreuder *et al.*, 2010). It may be equally a factor explaining professional mobility and related to senior workers' preference for retirement (Li *et al.*, 2011; Blanchet and Debrand, 2007).

The study proposed here exposes empirical new results on the relationship between health status and perceived

ERI at work using data from SHARE carried out in 2004 and 2006. The sample base is composed of individuals aged between 50 and 60 in 2004, working in 2004 and 2006, residing in one of the eleven countries participating in the survey; that is a total of 3,668 respondents (Sources insert). Two health status indicators are used: self-declared activity limitations and joint pain or backache over the last six months in 2006¹. Activity limitations concern 22% of the respondent seniors and backache or joint pain, 44%. The effort-reward imbalance is identified from two questions administered to respondents: one concerning respondents' wage satisfaction in relation to efforts expended at work, the other on respondents' perceived recognition for their work². These two questions were extracted from a single indicator aimed at describing the notion of 'low reward in relation to the work effort supplied'. This indicator distinguishes two situations: (1) wages considered insufficient in relation to the effort expended

¹ We retained two health status indicators, one to identify activity limitations and the other, backache or joint pain in 2006. They were based on the following questions (for further details see: Briant, 2010):

- Over the last six months, to what extent have health problems limited your normal activities? Responses were classed in two categories: (1) 'considerably limited' or 'limited but not excessively' and (2) 'has not limited'.

- Over the last six months, have you suffered from [...] the following health problems: 'backache, pains in the hips or knees or any other joint pains'?



The study presented here fits within the framework of IRDES research on the relationships between work and health, that has focused on older workers' labour participation in relation with health status and demanding working conditions and the relationship between health and career pathways. This study is based on the author's thesis research.

and failure to receive the deserved recognition for one's work (wages and recognition unsatisfactory) and (2) being satisfied with at least one of these two work-related factors. According to this indicator, 18% of seniors considered that the rewards received for their work effort (wages and recognition unsatisfactory) was unsatisfactory in 2004 and 17% in 2006; that is to say in the first of the two situations.

All other things being equal (Methods insert), seniors experiencing ERI in both 2004 and 2006 face an 8 point higher risk of activity limitations than those considering the rewards received to be satisfactory in 2004 and 2006 (graph 1) and a 12 point higher probability of being

² Respondents express agreement or disagreement with the following statements: 'given all my efforts, my wages are correct'; 'I receive the recognition I deserve for my work'.

SOURCES

This study uses 2004 and 2006 SHARE survey data on health, ageing and retirement in Europe (*cf.* www.irdes.fr/Share). SHARE is an international research infrastructure recognised by the European Community and coordinated by the Mannheim Research Institute for the Economics of Ageing. In each participating country, the survey is supervised by researchers. In France, the first two waves were jointly conducted in 2004 and 2006 by IRDES and INSEE.

In 2004, the sample base concerned households in which at least one member was aged 50 or over. This sample consisted of 32,000 individuals in eleven European countries: Austria, Germany, Switzerland, the Netherlands, Spain, Italy, France, Denmark, Greece, Sweden and Belgium. The same sample base was used in the 2006 survey wave thus permitting the same respondents to be monitored through time.

The sample retained for this study is made up of 3,668 respondents aged between 50 and 60 years old interviewed in 2004 and again in 2006, and in employment during both survey periods.

METHOD

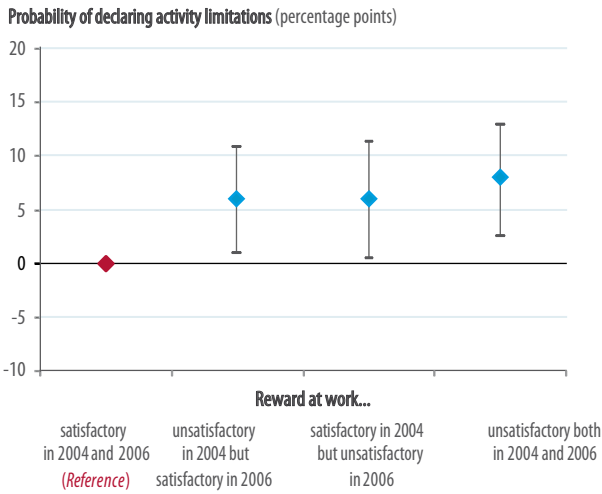
Two multivariate analyses were carried out for this study.

The first, using dichotomous Probit models, aimed at measuring the correlation between perceived rewards of labour effort on activity limitations and back or joint pain, all other things being equal, that is by controlling the effects of the following variables: professional category, physically demanding work, constant pressure due to heavy work loads, autonomy at work, perception of chances of keeping one's job, support at work, age, gender, total household income, level of education and country. The results are reported in graphs 1 and 2.

The second multivariate analysis, equally using a dichotomous Probit model, permitted the study of work-related variables associated with the feeling that the rewards received for one's work effort are low in relation to the effort expended (see result on table p.4). Three categories of variables relating to work and the employment of older workers were introduced (professional category, wages, company size, job difficulties, the perception of one's chances of being able to keep one's employment and private versus public sector, individual characteristics (gender, age and level of education) as well as a country indicator.

G1

Perceived ERI at work and the probability of declaring activity limitations



Reading guide: For senior workers perceiving ERI at work both in 2004 and 2006, the probability of activity limitations is 8 points higher than for those satisfied with the rewards received for their work in both 2004 and 2006 (confidence interval at 95% for this estimation : [2.5 points; 13.5 points]).

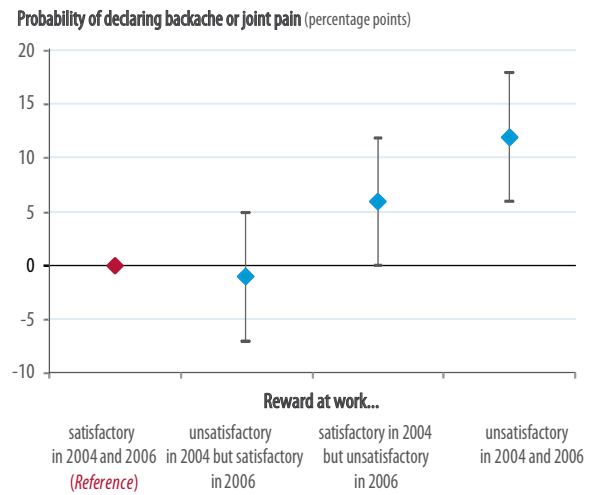
Source: IRDES, 2004-2006 SHARE survey data.

Sample: Seniors aged between 50 and 60 years old in 2004, working in 2004 and 2006.

Data download: www.irdes.fr/EspaceRecherche/Qes/Qes166/Qes166_RecompenseTravailSanteSeniors.xls

G2

Perceived ERI at work and the probability of declaring backache or joint pain



Reading guide: For senior workers receiving low rewards in both 2004 and 2006, the probability of declaring backache or joint pain is 12 points higher than among seniors receiving a satisfactory reward both in 2004 and 2006 (confidence interval at 95% for this estimation: [6.0 points; 18.0 points]).

Source: IRDES, 2004-2006 SHARE survey data.

Sample: Seniors aged between 50 and 60 years old in 2004, working in 2004 and 2006.

Data download: www.irdes.fr/EspaceRecherche/Qes/Qes166/Qes166_RecompenseTravailSanteSeniors.xls

affected by backache or joint pain (graph 2). Furthermore, senior workers experiencing ERI at one point in time, in this case either in 2004 or 2006 only, are equally more likely to be affected by activity limitations, backache or joint pain compared with those perceiving the rewards received for their work effort to be satisfactory in both 2004 and 2006, but the gap appears less pronounced. This would suggest that the adverse health effect of ERI increases the longer the exposure.

However, other than a causal effect of ERI on health status, these results also evoke other possible explanations. They may notably reflect inverse causality. They may reflect a deteriorated perception of ERI at work due to health problems or the effect of discrimination related to the individual's health status. The possible dual causality between health status and ERI was demonstrated by Shimazu and de Jonge (2009) using a longitudinal data structural equation model (constituted from three successive survey waves).

High effort for low reward is primarily perceived by blue-collar workers, clerks³, workers in low wage, physically demanding and precarious employment

First of all, the perceived effort-reward imbalance indicator is related to the individual's wage bracket and socio-professional category. The probability of receiving low reward for high effort diminishes as wages increase all other things being equal (table). This probability is 8 points higher among blue-collar workers compared with executives, and 6 points higher among clerks; senior workers in non-executive or non-managerial positions thus more frequently consider that the reward and recognition for their work effort is unsatisfactory.

³ Copy editor's note: In this text, the word 'clerks' refers specifically to office employees and employees working in administrative and commercial services (business).

The ERI is then measured against job demand. Senior workers in physically demanding employment more frequently express the feeling of receiving low rewards for their work effort. Compared with senior workers in physically undemanding jobs both in 2004 and 2006, those subject to physically demanding work in both periods increase the risk of receiving low rewards by 6 percentage points. Furthermore, an increase in physical demands between 2004 and 2006 appears to increase the risk of low rewards in 2006 (+ 6 points). The compensation for physically demanding work is thus not in conformity with workers' expectations. These results are contrary to the compensatory differences hypothesis (Rosen, 1986) according to which demanding work is subject to higher remuneration to compensate for the loss of satisfaction due to this demand.

Senior workers declaring being under constant pressure due to a highly demanding work load equally more frequently experience ERI. Compared to older workers

not exposed to this constraint either in 2004 or 2006, exposed senior workers have an increased probability of receiving low reward for their work effort by 9 percentage points. Senior workers not concerned by this situation in 2004, but experiencing work pressure in 2006 however, have no additional risk of being inadequately rewarded. It suggests that, contrary to an increase in physical demands, higher work pressure due to an increased workload is compensated for.

These results are globally similar to those outlined in other empirical studies dealing with the relationship between wages and working conditions. According to Gollac and Baudelot (1993) for instance, with the exception of certain trades with visible and recognised constraints, a number of work demands and risks are not compensated for by supplemental wages. The results of this study notably indicate significantly lower wages for high demands and risks associated, among other things, with the manipulation of heavy loads (-3.4%). Nevertheless, according to the same study, being on permanent night shift increases wages by +8.7%; working on 3x8 and 2x8 shifts respectively increases wages by +4.7% and +2.5%. This supplemental wage does not however presume to be in conformity with workers reward expectations.

Finally, according to our results, the probability of ERI is linked to precarious employment. The probability of receiving low rewards for high effort is greater among senior workers expressing perceived job insecurity. Workers in this situation in both 2004 and 2006 have a 7 point higher probability of receiving low rewards in 2006 compared with those not concerned. In addition, the increased risk of job insecurity between 2004 and 2006 is correlated with an increase probability of experiencing ERI by 9 points.

Workers in small companies with less than 15 employees and self-employed workers are less affected by ERI at work

Senior workers in companies with less than 15 employees are less likely to experience ERI at work than those in compa-

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Probability of perceiving ERI at work in 2006

	Parameter (in percentage points)	Confidence interval	
		Lower bound	Upper bound
Age (Ref.: 50 to 53 years old)			
54-56 years	0 Ns	-3	3
57-60 years	-1 Ns	-4	2
Gender (Ref.: women)			
Men	-3	-6	-1
Level of education (Ref.: university)			
Secondary school	0 Ns	-4	3
< Secondary school	0 Ns	-3	3
Socioprofessional category (Ref.: executives)			
Clerks ³	6	3	10
Skilled blue-collar workers	5 Ns	-1	10
Unskilled blue-collar workers	8	3	13
Salary			
Log (salary)	-1	-3	0
Sector of Activity (Ref.: public sector)			
Private sector	0 Ns	-4	3
Company size (Ref.: 25 to 199 employees)			
Self-employed workers	-8	-11	-5
Less than 5 employees	-5	-9	-2
5 to 14 employees	-6	-9	-3
15 to 24 employees	-3 Ns	-7	1
200 to 499 employees	-3 Ns	-7	1
Over 500 employees	-4	-8	0
Declaration of physically demanding work (Ref.: neither in 2004, nor in 2006)			
In 2004 but not in 2006	1 Ns	-4	5
In 2006 but not in 2004	7	1	12
In both 2004 and 2006	4	1	7
Declaration of constant pressure due to heavy work load (Ref.: neither in 2004, nor in 2006)			
In 2004 but not in 2006	0 Ns	-4	4
In 2006 but not in 2004	3 Ns	-2	8
In both 2004 and 2006	9	6	13
Declaration of risk of losing one's employment (Ref.: neither in 2004, nor in 2006)			
In 2004 but not in 2006	4	0	8
In 2006 but not in 2004	9	4	15
In both 2004 and 2006	7	2	12
Country of residence (Ref.: France)			
Switzerland	-14	-16	-11
Germany	-11	-14	-8
Denmark	-11	-14	-8
Spain	-11	-14	-7
Sweden	-11	-14	-7
Belgium	-10	-13	-7
The Netherlands	-9	-12	-6
Greece	-3 Ns	-8	4
Austria	-2 Ns	-8	4
Italy	-1 Ns	-8	4
N : 3 668 respondents			

Ns: non significant parameter at the 5% level.

Reading guide: In comparison with executives, the probability that clerks will experience ERI at work is 6 percentage points higher. The confidence interval at 95% for this estimation is between 3 and 10 points inclusive.

Source: IRDES, 2004-2006 SHARE survey data.

Sample: Seniors aged between 50 to 60 years old in 2004, in employment in 2004 and 2006.

Data download: www.irdes.fr/EspaceRecherche/Qes/Qes166/Qes166_CentresDeSantePrecarite.xls

nies with between 25 and 199 employees. This relationship between company size and ERI can partly be explained by the fact that smaller companies are more apt to favour the reciprocal relationship between reward and effort as they are more conducive to internal communication. But this relationship appears *a priori* to be in contradiction with the observation that wages and advantages in terms of social protection tend to increase with company size. Other results, however, indicate that in companies counting 200+ employees, the risk of ERI tends to decline thus reiterating the association between company size and wages and other forms of remuneration. Future studies based on surveys conducted among workers of all age groups should permit an in-depth analysis of the relationship between the perceived rewards for work effort expended and company size.

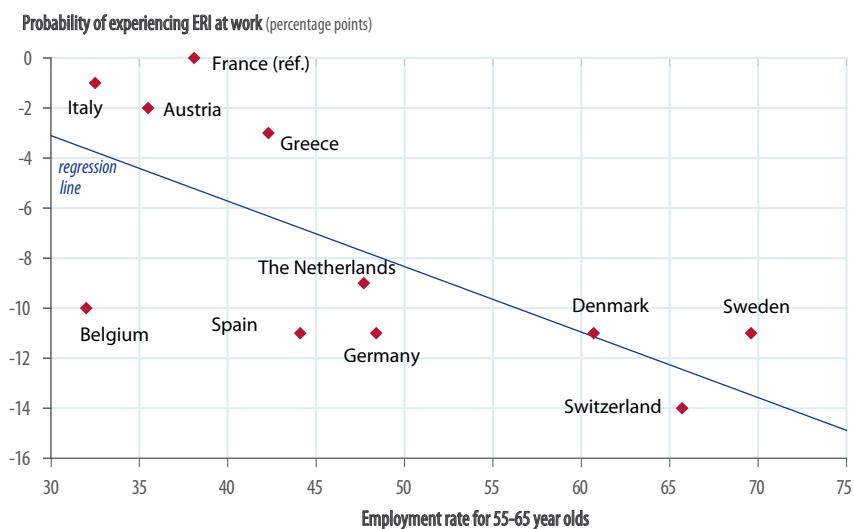
Results indicate also that self-employed workers are less exposed to the risk of ERI at work than workers in companies counting from 25 to 199 employees: on average the probability of receiving a low reward is lower by 8 percentage points. This result may be linked to the result that this category of workers has a globally higher level of work satisfaction than other categories as indicated by the INSERM Collective Expertise report (2011). However, it is important to remind that, as indicated by this same source, self-employed workers are more frequently affected by other psychosocial risk factors, notably working in isolation. Furthermore, a comparison between average working situations should nevertheless be undertaken with caution as self-employed workers represent heterogeneous situations.

Cross-country disparities remain high

Thus the ERI indicator seems to be closely related to senior workers' employment characteristics. As for individual characteristics introduced in the analysis – three age groups (50 to 53 years old, 54 to 56 years old and 57 to 60 years old), level of education and gender –, their influence on the perception of ERI is relatively limited.

G3

Perceived ERI at work and employment rate of senior workers in 2006



Reading guide: The points indicated on this graph correspond to the eleven countries that participated in the 2004 and 2006 SHARE surveys. The abscissa represents the employment rate of workers aged 55 to 65 in 2006. The ordinate represents the probability of experiencing ERI in the country concerned relatively to France (reference); it corresponds to the results presented in the table on P.4). The regression line represented on the graph indicates a negative correlation between senior employment rate and perceived ERI.

Sources: IRDES, 2004-2006 SHARE survey data (results taken from the table on P.4); Eurostat: Employment rate of 55-65 year olds in European countries in 2006.

Data download: www.irdes.fr/EspaceRecherche/Qes/Qes166/Qes166_RecompenseTravailSanteSeniors.xls

It however reveals a gender difference in that the probability of experiencing ERI is 3 percentage points higher for women than men.

On the other hand, considerable cross-country differences in perceived ERI at work emerged. These differences oppose France, Italy, Greece and Austria on the one hand, countries in which older workers are more frequently concerned by the risk of ERI at work, with Switzerland, Denmark, Sweden, Germany, Belgium, the Netherlands and Spain on the other. This opposition partly reflects the differences between countries associating a low employment rate of seniors workers and a low quality of employment and those with higher performance levels in this respect. In countries with a relatively high employment rate of senior workers, the feeling one is adequately rewarded for one's work effort is more pronounced (graph 3). These cross-country differences in ERI can be explained by the choice of policies to improve older workers' employment opportunities. They are equally to

be sought in the differences in economic performance, working relationships, management methods and historical-cultural differences. The analysis of each country, and specifically the observation of their evolutions through time, should permit a better understanding of these differences. Studies such as this can be envisaged from the next SHARE waves that will provide a bigger sample base in each country concerned.

* * *

In this study, we have focused on one of the dimensions of psychosocial risk at work among employed seniors aged between 50 and 60 years old in Europe based on the Siegrist model (1996). Our results fit within the framework of quantitative epidemiological research studying the association between health status and ERI at work. Our study indicates a higher probability of reporting activity limitations and backache or joint pain among workers considering they receive low reward for work effort expended than workers for whom the

reciprocity between high effort expended and reward received is considered satisfactory. An improvement in the reciprocal relationship between work effort expended and reward received thus appears to constitute an action area to preserve individuals' state of health and maintain them in employment for as long as possible.

The question is then how to favour this reciprocity. In order to answer this question, a better understanding of the factors explaining perceived effort-reward imbalances is necessary. According to our results, physically demanding work and high pressure

due to heavy work loads are related to the feeling of receiving low reward for high effort expended. Those characteristics of work compensated for in conformity with workers expectations would be one way of redressing ERI. In addition, the feeling one is being inadequately rewarded for the work effort expended is associated with insecure employment. More generally, the ERI is added to other negative employment characteristics. Furthermore, situations in which low rewards for work effort appear more significant in companies of between 25 and 199 employees and less frequently concern small companies

and self-employed workers. Finally the perceived reward received for work effort varies considerably from one country to the next reflecting the better performance of northern European countries and certain continental countries in terms of older workers' employment quality.

Other surveys and the next SHARE survey waves with larger sample data should allow a finer analysis of the different possible explanatory factors in the perception of effort-reward imbalance, the way it evolves through time and the role played by European country specificities. ♦

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